Comments and questions regarding this section may be directed to the person listed below:

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NOTE: This Section's Sign-Off Record is maintained in the ESH&A Office, G40 TASF.

TABLE OF CONTENTS

SECTION 2 – QUALITY ASSURANCE PROGRAM

REVISION / REVIEW LOG

SECTION 2 – QUALITY ASSURANCE PROGRAM

Review Number:	Effective Date:	Contact Person:	Pages Affected:	Description of Revision:
0	05/01/00	Kate Sordelet	All	Original Issue

SIGN-OFF RECORD

The Environment, Safety, Health and Assurance Program Manual has been reviewed and approved as documented below.

Reviewed by: _____ **Date:** 5/30/00
Environment, Safety, Health & Assurance

Approved by: _____ **Date:** 6/23/00
Division Director – Chief Operations Officer

Approved by: _____ **Date:** 6/27/00
Division Director- Science and Technology

Approved by: _____ **Date:** 7/17/00
Deputy Director

Approved by: _____ **Date:** 7/17/00
Director

2.0 QUALITY ASSURANCE

2.1 MANAGEMENT

Applicability Statement:

The Management section applies to all employees as it provides an overview of the Laboratory's organizational structure. ***Refer to the Institutional Plan which provides the Ames Laboratory's mission, roles and core competencies. An overview of the Laboratory's organization structure is also provided on page forty-nine. The Institutional plan is located at: http://www.internal.ameslab.gov/oipp/index.html***

2.2 TRAINING

Applicability Statement:

The Training section applies to all employees. Program development resides with the Training Program with implementation assistance from Subject Matter Experts, Human Resources, Occupational Medicine, Program/Department Managers, Group/Section Leaders, Supervisors, Safety Coordinators and Representatives. ***Refer to Section 3 for a detailed review of Training Program Information.***

2.3 CONTINUOUS IMPROVEMENT PROGRAM

Applicability Statement:

The Continuous Improvement section applies to all employees. Program development resides with all Program/Department Managers with implementation assistance provided by Environment, Safety, Health and Assurance and appointed Quality Assurance Coordinators.

2.3.1 REFERENCES

Policy 10200.006 Integrated Safety Management Policy
Plan 10200.009, Safety Coordinator and Representative Program Implementation Plan
Procedure 10200.029 Needs Assessment Procedure
Plan 10200.020, Ames Laboratory Lesson Learned Implementation Plan
Plan 10200.008, Employee Safety Concerns Program Implementation Plan
Procedure 10200.010, Readiness Review
Procedure 46200.003, Ames Laboratory Procurement Quality Procedure
Procedure 10200.026, Documents & Records Inventory Procedure
Procedure 10200.001, Writing Formal Procedures
Procedure 10200.003, Writing Stand Alone Policy
Procedure 10200.004, Writing Plans
Procedure 10200.005, Forms Management

2.3.2 BACKGROUND

The Laboratory instituted many formal continuous improvement programs as a result of Tiger Team Corrective Action Plans and the implementation of the Quality Assurance Order (DOE Order 5700.6C). All of the Laboratory's quality areas were strengthened including, Management, Training, Quality Improvement, Documents, & Records, Work Processes, Design, Procurement, Inspection & Acceptance Testing and Assessments. The Laboratory continues to enhance many of its programs and systems to support the principles and core functions of Integrated Safety Management.

2.3.3 PROGRAM INFORMATION

The following discusses the principal continuous improvement aspects for the scientific process and for managing daily Laboratory operations.

2.3.3.1 Continuous Improvement within the Scientific Process

The steps in assuring the continuous improvement of research in a diverse research environment include: selection of highly qualified and motivated people, the choice of research topics that reflect programmatic and scientific interest, the conduct of research, and the review of results by independent, competent peers. These steps are utilized at the Ames Laboratory to produce documented research results that are verifiable and able to withstand scrutiny by reviewers, potential users, and the entire research community. The following sections address the Selection of the Researchers, the Choice of the Research Topic, the Conduct of Research, and the Review of Results by Peers.

Selection of the Researchers

Three processes are used to select researchers in different job classifications at the Ames Laboratory. Many of our Group Leaders, i.e., those individuals leading groups actively engaged in the creation of new knowledge, hold joint appointments with an academic department of Iowa State University. These individuals are selected through a joint scrutiny by the Laboratory and the department. This involves a national search with many applicants, which is narrowed through a process of letter of recommendation, contacting references, and on-campus interviews. When an individual is hired at the assistant professor level, further evaluation is made before tenure is extended, including an additional gathering of external letters of recommendation, so that an explicit mechanism is available to correct any initial errors. Not all of our shared faculty start at the assistant professor level. Others join the Laboratory after a period at the University or leave the Laboratory to return to a full-time University appointment after a period of time. These personnel changes can be driven by researcher performance or changing priorities in the Laboratory's research programs.

The remainder of our Group Leaders, as well as most of our full-time supporting staff, are members of the Professional and Scientific employment category of the University. Although tenure is not a consideration, the procedures for recruiting, hiring, and evaluating are modeled after those for individuals with academic components to their appointments. In addition, a number of these scientists hold adjunct appointments, which subjects them to partial review by the academic department.

A significant part of our "hands-on" work is conducted by graduate students. These individuals are carefully screened by the academic department as part of the admission process. There are also several hurdles that each must pass in order to proceed through candidacy to the receipt of a degree.

Choice of the Research Topics

The selection of individual research topics within established programs involves a three-way interaction between the individual researcher, the Ames Laboratory Program Director, and his or her counterpart in Washington. The details are program specific, but the following elements are generally involved. Detailed ideas and approaches generally start at the individual scientist level. After review by the Program Director and senior laboratory management, the ideas are presented to DOE technical staff as a part of program review, DOE workshops, the work authorization documents, or related processes. The ensuing dialog leads to the final definition of the project. This "bottom up" approach, however, is constrained by "top down," broad programmatic guidance. The general areas of interest to DOE are identified by the Program Director and senior laboratory management in consultation with DOE staff and written descriptions of their programmatic thrusts. This information is communicated to the staff to guide their selection of particular research topics. The above process ensures selection of topics relevant to the interests of DOE.

The above comments pertain to existing programs. There are occasionally opportunities to initiate new areas of research when the changing needs of DOE match capabilities of Iowa State University. In those cases, the process is somewhat different. Senior management of the Laboratory first identify the opportunity. Then technical ideas are sought, both from existing laboratory personnel as well as other members of the Iowa State University research community with the appropriate technical expertise. These ideas are reviewed locally by senior Laboratory

technical management and then forwarded to DOE for appropriate evaluations, the form of which is initiative specific. Successful completion of this step may lead to a new program, which is then handled in the more traditional manners discussed above.

Conduct of Research

The primary responsibility for the proper conduct of the research lies with the Program Director and the Group Leader. They are responsible for planning the research including resource requirements, methodology, scheduling, and funding; and the specification, evaluation, and acceptance of the materials and supplies that are required to conduct the investigation.

The conduct of research is critiqued by Ames Laboratory peers within the programmatic area. Most of Ames Laboratory's larger programs have periodic meetings at which individual researchers present their recent results in a seminar format. Their approach, methodology, and findings are often critiqued through question and answer sessions.

When the work is prepared by a student, additional input is obtained from outside the academic department. Each student's work is evaluated by a committee, which generally includes scientists whose work is not supported by the DOE. Their input provides a different perspective, which enhances creativity and prevents stagnation.

Review of Results by Peers

The results of research performed at the Ames Laboratory are reviewed by peers through various mechanisms.

Much of the work is presented verbally at national technical meetings before being documented in writing. These presentations provide opportunity for input from an even broader community. Also, a rigorous program review procedure is in place for most of the programs. Details are program specific. However, the following elements are common. A group of external reviewers is selected by Laboratory management to conduct the review. Researchers to a group including Laboratory staff and management, the reviewers, other interested University scientists, and some external guests. Additional one-on-one discussions between the scientist and the reviewers follow. The reviewers then present their findings, both verbally and in writing, to the Program Director and Laboratory management. The results are communicated to the scientist in anonymous form and corrective action is taken if needed. The nature of the input includes an evaluation of the correctness of the scientific approach, importance of the topic, and appropriateness to the character of the institution and the needs of the nation. An additional part of the review is the subject of new directions in which the Laboratory should extend its efforts to maintain a balanced program.

Finally, the results of research efforts are often published in referee reviewed journals. These results are therefore reviewed before acceptance by the publisher, through letters to the editor of the journal, and through the discussions presented in the specific journal articles.

2.3.3.2 Continuous Improvement for Laboratory Operations

The continuous improvement activities discussed below, provide for daily incremental improvements and support the philosophy of Integrated Safety Management.

Employee Concerns Program

Ames Laboratory requires employee involvement in the environment, safety & health program implementation. The Employees Concerns Program was implemented to encourage comments, opinions, and recommendations for the continuous improvement of Ames Laboratory work practices. Employees may fill out an Incident / Concerns Reporting Form in the ESH&A office at any time. Confidentiality is maintained upon request. ESH&A formally evaluates each concern and facilitates any corrective actions. Employee concerns are tracked and trended each year and shared with the DOE.

Communications

The Laboratory's communications have been enhanced by the utilization of Department newsletters, Web homepages and structured email distribution lists. Newsletters are published by the Purchasing & Property Services Department, Information Systems, Engineering Services, which provide policy updates, operational tips, and specialist assistance. In addition, the Laboratory's Management Code System registers each employee's management oversight and promotes accountability and accurate communication coverage.

Lesson Learned

Internal and external Lesson Learned are distributed to all Ames Laboratory employees via ESH&A's Web page at: http://www.external.ameslab.gov/esha/index.html. This information is utilizes to continuously review activities, including associated training, documentation, and the work process itself.

Committees/Teams/Surveys

Ames Laboratory values the contributions made by special focus committees. These committees are utilized by the Laboratory to assist with numerous managerial concerns, including recommending policies and procedures. The Environment, Safety, Health and Assurance Office will maintain original committee charters. Committees/Teams that frequently impart continuous improvement measures are the Safety Review Committee, Electrical Safety Committee, SPINPAC, and the Needs Assessment Team. In addition to committee work enhancements, various Administrative Departments have prepared surveys to assess their customers satisfaction and have improved their work processes to better serve the customers needs.

Safety Coordinator/Representative Program

Safety Coordinators and Safety Representatives represent the Program Directors/Department Managers and Group/Section Leaders at specialty training sessions and meetings in order to compliment the transfer of written information to the organizations and to serve as facilitators of safety related actions. A detailed description of this program can be found in the Introduction Section (1.4).

Readiness Review Review Process

Readiness Review Process provides the mechanism to review all existing and new activities throughout the Laboratory. A detailed description of this program is provided in the Introduction Section (1.5.3.1).

Needs Assessment Program

The Needs Assessment Program provides a mechanism to identify hazards, training needs, and job task elements. The program helps ensure that each employee has the physical capability of

performing their job and identifies appropriate training modules so that they may perform the job safely and effectively. Employees and their supervisors formally review identified training (Employee Training Profile) on an annual basis. A detailed description of the Needs Assessment Program can be found in the Training Section (3.3.1).

Purchases/QA Rating System

All items purchased are coded by the Laboratory's Purchasing and Property Services Department. Items with selected codes are then review on a daily basis by the Engineering Services Group to ensure that safety & health issues are addressed. Items that are utilized for a new activity will be directed to the Safety Review Committee for review.

Also, a physical review of purchases is performed by warehouse employees to prevent the acceptance or distribution of goods with any noticeable nonconformance from stated criteria, e.g., general item description, shortage, overage or damage. Such deliveries shall be held at Receiving until clarification/authorization is received from the requestor. However, formal acceptance, according to required specifications, is the responsibility of the end user and requestor of the goods

Documentation Procedures

The Laboratory utilizes documentation procedures to formalize and control the development, and registration of policies, procedures, plans, manuals, forms and guides. All documents with impact limited to a specific Program/Department or Group/Section shall be logged within that issuing area. Documents with interdepartmental, Division, or Laboratory impact shall utilize documentation procedures to control the formatting, review, and approval process. These documents shall also be registered with the Environment, Safety, Health & Assurance Office. Further information on this topic is available in section 2.4.3.1.

Assessment Program

The Laboratory Assessment Program consists of Worker Observations, Program/Department Walk-Throughs, Independent Walk-Throughs, and external assessments. In addition, the Laboratory conducts a detailed Self-Assessment annually while reporting on Contract performance measures on a bi-annual basis. All concerns that result from these assessments are tracked, closed-out, and verified in accordance with their assigned risk level. Further information on these assessment elements is available in Section 10.

2.3.4 TRAINING

Detailed programmatic information is provided via the following institutional training modules:

GENERAL EMPLOYEE TRAINING (Various Continuous Improvement Programs) #AL- 001	
Intended Audience:	*All employees*
Module Format:	*Classroom Instruction, reviews various CI Programs, Needs Assessment, Employee Concerns Program, Safety Coordinator/Representative Program, etc.*
Associated Retrain Period & Format:	*Retrain is required if employee has been terminated from the Laboratory for more than one-year period.*

2.3.5 PERFORMANCE CHECKLIST

Laboratory Director – Shall:

- Actively support Integrated Safety Management and all quality assurance activities, which ensure its success.

Program Directors/Department Managers and Group Leaders- Shall:

- Select researchers and plan research direction.
- Maintain an open-door policy where employees can communicate any safety concerns.
- Review Lesson Learned and share appropriate lessons.
- Direct Safety Coordinator/Representative activities.
- Ensure that new activities undergo Readiness Review and that Activity Status Reviews are conducted on existing activities.
- Ensure that employees complete the Needs Assessment Process.
- Ensure Employee Training Profiles are reviewed during the Performance Appraisal Process.
- Ensure that all active procedures, policies, plans etc. are logged by there appointed Document Control Logkeeper.
- Participate in an annual self-assessment (walk-through) of their assigned area.

Environment, Safety, Health & Assurance - Shall:

- Maintain an open-door policy where employees can communicate any safety concerns and track the closeout of their concerns.
- Gather appropriate Lesson Learned articles and disseminate them via ESH&A's homepage.
- Oversee the Laboratory's Safety Coordinator/Representative Program.
- Serve as Lead Specialists during the Readiness Review process.
- Coordination all Needs Assessment Program elements.
- Coordinate all the elements of the Laboratory's Assessment Program.
- Review, log and route for approval all Laboratory documents that have Lab wide or interdepartmental impact.

2.4 DOCUMENTS & RECORD PROGRAM

Applicability Statement:

The Documents and Records section applies to all employees. Program development resides with the Documents and Records Program with implementation assistance provided by the Laboratory's appointed Record Liaisons and Document Logkeeper Custodians (DLCs).

2.4.1 REFERENCES

DOE O 200.1 Information Management Program
36 CFR Chapter 12, Part 1200-1299
DOE Roadmap to the Year 2000
Research and Development Report Procedures and Guidelines (No. IS-5079).
Technical Information Requirements Concerning Manuscripts Submitted to Journals and Conferences (No. IS-5084).
Procedure 10200.026, Documents & Records Inventory Procedure
Procedure 10200.001, Writing Formal Procedures
Procedure 10200.003, Writing Stand Alone Policy
Procedure 10200.004, Writing Plans
Procedure 10200.005, Forms Management
Plan 10200.002, Ames Laboratory Documents and Records Management Plan

2.4.2 BACKGROUND

The Documents and Records Program ensures a sound records management program for the creation, maintenance and use, and final disposition of all Laboratory records. This program was implemented in response to the Records Management Planning Initiative (March 1993). The primary emphasis has been placed on the Document Control Program; the Inventory/Scheduling Initiative; the surveying of potentially contaminated records; the Vital Records Program; the maintenance, storing and protecting of inactive records; and Records Management Guidance.

2.4.3 PROGRAM INFORMATION

2.4.3.1 Document Control Program

Document Control is the process of controlling the identification, preparation, review, approval, issuance, distribution, and cancellation of documents to ensure that only correct and current versions of the document are used in the work place or transmitted to outside entities. The level of document control shall be established according to the complexity and hazards associated with the activities represented by the document. Authors, Division Directors, and Program Directors/Department Managers are responsible for the initial release, distribution, and control of changes to documents originating within their supervision. They are responsible for directing the document user on how to dispose of obsolete documents. Revisions to these documents are to be performed by the responsible author. Documents with Laboratory-wide impact shall be registered with Environment, Safety, Health & Assurance, 125 Spedding. The following items

have been implemented to aid in a sound Document Control Program: Documentation Procedures, Document Control Program Database, Controlled Document Guidance and the Directives Program.

Documentation Procedures

Documentation Procedures were created to aid in the formalization and consistency of plans, policies, procedures, forms, handbooks and guides that impact at the Laboratory level. Employees charged with drafting documentation receive assistance from ESH&A on the proper formatting, approval, and registration actions needed to create Laboratory impacting documentation. ESH&A provides a document review function to ensure consistency and submits documents for final approval signatures. Approved documents are then distributed to the author and the original documents are registered and maintained by ESH&A.

Document Control Program Database

The database provides for the electronic registration of procedures, policies, plans, manuals, forms, handbooks, and guides that impact at a Laboratory-wide level. Registration allows for retrievability and accountability by tracking associated information for each document type, e.g., author, effective date, review date, revision number, etc. The original, hard copy record is also maintained by ESH&A, 125 Spedding.

Controlled Documents

Controlled Documents are designated as such when the document warrants a more stringent issuance and revision policy. The issuing Program/Department makes this determination if usage of the out-of-date documents would endanger the safety and performance of the activities addressed by the document. This determination is based on the complexity and hazards associated with the activities represented by the document. Each copy of a "Controlled Document" is uniquely identified and tracked by the issuing group. Those "Controlled Documents" that impact at the Laboratory level shall be noted as registered documents on the Laboratory's Documents and Records Database. The issuing group also ensures that all copies have corresponding revision dates and that future revisions are circulated in a timely fashion. "Controlled Documents" which are loose leaf in format are updated by an appointed individual from the issuing group to safeguard against outdated document versions. If the issuing group maintains the records of outdated versions, they shall be marked "superseded" or "cancelled." Otherwise outdated versions are destroyed.

Directives Program

The DOE Directive System at the Ames Laboratory provides a means by which requirements and expectations in administering our prime contract are communicated to management at the laboratory. All Directives are received and logged by the Chief Operations Officer (COO). The COO provides a first review of the document to determine whether 1) the Directive has already been implemented by the Laboratory, 2) the Directive is applicable to the Laboratory, 3) the Directive requires an action plan or response. If the Directive requires a response, the COO assigns an appropriate Action Manager. Furthermore, all other parties that are affected by the Directive are also sent copies of the Document and are considered Directive Coordinators. These Coordinators shall assist the Action Manager with any reports or developmental/ implementation plans. It is the Action Managers responsibility to complete all outstanding issues by the suspense date identified by the DOE. In addition, the Action Manager shall provide a close out response for the COO by the indicated suspense date.

2.4.3.2 Record Inventorying/Scheduling Initiative

Each Program/Department shall have an appointed Record Liaison. The Record Liaison shall be responsible for inventorying the record series for their area of charge. This includes the identification and description of the areas records series. It is suggested that administrative records follow series titles as indicated in the *General Records Schedule* and that scientific research records be maintained as individual project case files. In addition, the Record Liaison shall maintain the file plan that generates from the Records Management Database (Versatile) and for disposing of records that have passed their mandatory retention period *(please note that there is a freeze on all epidemiological records)*. All inactive records that have not passed their retention period shall be electronically indexed, bar coded, scheduled, protected, and stored in one of the Laboratory's Records Holding areas.

2.4.3.3 Surveying of Potentially Contaminated Records

A Radiological Survey shall be performed on Laboratory Research Notebooks and any other records that may be potentially contaminated. Researchers should contact the Health Physics Group at 4-2153 if they have a Laboratory Research Notebook that was issued prior to 1966, if they have performed radioactive materials work or if they suspect a Laboratory Notebook may be contaminated based upon their process knowledge. Once the Laboratory Research Notebook has been cleared it shall receive a *Contamination Survey Label* and be microfilmed.

2.4.3.4 Vital Records Program

The Vital Records Management Program has been implemented to protect and access Emergency Operating Records and Rights and Interest Records. The Laboratory's personnel roster and financial information is protected on a daily backup tape. Laboratory Research Notebooks issued after 1984, all Official Personnel Files terminated after 1993, and Employee Medical Files terminated after 1980 have been microfilmed. One microfilm copy will be kept by the Laboratory along with the original document and will be maintained apart from each other. Another microfilm copy will be maintained by CREST Information Technology in a secured vault.

2.4.3.5 Pertinent Records

Pertinent records demonstrate the completion of fundamental work. Below is a description of the Laboratory's pertinent records and databases.

<u>Laboratory Research Notebooks</u>

Laboratory research notebooks shall be obtained from the Ames Laboratory Storeroom. Each notebook receives a bar code number and all pages are pre-numbered. A guidance statement for maintaining laboratory notebooks is permanently affixed to each notebook issued. These guidelines do not describe the consistency of entries; rather, they suggest certain types of information to be logged and offer an accompanying formatting procedure to facilitate the Laboratory's current microfilming process. Laboratory notebook entries must include significant experimental results and discoveries (potential inventions) and shall include signatures of two witnesses of competent understanding. A Laboratory Research Notebook must be submitted to the ESH&A's Documents & Records Office, 125 Spedding once it has been completed or upon the researcher's checkout from Ames Laboratory. The notebook is surveyed, filmed and entered

into the Laboratory's Lab Notebook Maintenance Database. The notebooks author, current location, survey status, and associated microfilm roll number are indicated on the database. Laboratory Notebooks can be checked out by other Ames Laboratory researchers or are housed in the Laboratory's Record Holding Area.

Ames Laboratory Training Records System (ALTRS)
The ALTRS maintains the electronic record training record of all Institutional Training Modules for each employee. It will be used in conjunction with the Laboratory's Needs Assessment Questionnaire and will provide an Employee Profile Report, indicating mandatory, suggested, and elective training modules. Refer to section 3.3.5 for more information.

Scientific and Technical Publications
Authors of Scientific and Technical Publications shall submit a copy of the following items to ESHA'S Documents & Records Office, 125 Spedding: 1) Journal articles which are being submitted for publication (draft copy), 2) Conference Proceedings, 3) Theses, 4) Research & Development Reports. The submission of these documents is necessary as it allows the Laboratory to apply for patent clearance and provides a measure of Ames Laboratory's contribution to the scientific community. Researchers are also requested to provide a final copy of their published journal articles to the Documents & Records Office to facilitate the future distribution of their work to other Researchers and to promulgate the Laboratory's scientific archive collection. In addition, it should be noted that journal reprint costs might be greatly reduced by taking advantage of submitting journal articles electronically to the publisher. Many publishers are waiving page charges and offering free reprints for these electronic submissions.

Software Development
Documentation of software development shall be maintained by the Group/Section responsible for the development of the software. Software development must be reported to the Manager of Information Systems and to the Intellectual Property and Technical Planning Coordinator, for subsequent reporting to the Department of Energy's Energy Sciences and Technology Software Center to be copyrighted or patented as appropriate.

Computer Software Inventory
In order to protect the government's interest in ADP hardware in use, an accurate inventory of hardware and software must be maintained, in accordance with U. S. Department of Energy Order CH 1360.2A. This policy is covered in Computer System Hardware, Software Inventory (Policy 50000.002). Attachment 1 of DOE Order CH 1360.2A states that all computer systems must have a risk assessment performed, must maintain an accurate inventory of hardware and software in use, and must have someone assigned to be responsible for their protection. The documentation of these activities shall be maintained by the CPPM and shall be available for review during on-site compliance reviews.

2.4.3.6 Maintenance, Storing, and Protecting

Maintenance, storing, and protecting of records is primarily accomplished by the use of an electronic database (Versatile) and storage within the Laboratory's Records Holding Area (RHA). The RHA meets the National Archives and Records Administration requirements as outlined in CFR for *Facility Standards for Agency Records Centers* and will accommodate approximately 3000 cubic feet of inactive records. The RHA is used to house only inactive records, whereas, active records are stored in office space. Records placed in the RHA are

access limited and all records of the Ames Laboratory are unclassified. Furthermore, additional storage is being planned and developed at the Ames Laboratory Warehouse.

2.4.3.7 Records Management Guidance

The following Records Management guidelines shall be utilized to comply with the Records Disposition requirements of 36 CFR. These guidelines include: record validation, identification of records (inventory), classification, retention, authorization and receipt control, preservation, safekeeping, and disposition. Also, these guidelines provide the framework to manage records generated as a result of Design, Training, Assessments, Corrective Actions, Calibration, Readiness Review, Procurement, etc.

Record Validation
Records are considered valid only if stamped, initialed, or signed and dated or otherwise authenticated by authorized personnel. Authentication may take the form of a statement by the responsible individual or organization. A valid record may be represented by the original record or a reproduced copy.

Inventory
An inventory shall be established to identify all active and inactive records by specific series descriptions. Records series shall be maintained as subject or case files. Also, Epidemiological, Vital (Emergency Operating Records and Legal Rights and Interest Records), Contaminated and Quality Assurance Record status shall clearly be noted on a record's Inventory Form. Inventory Form information shall be maintained on the Documents and Records Database. The contents of this inventory are defined in the Records Disposition Procedure (Procedure 10200.018).

Record/Non-record Classification
A record is defined by its presentation of authenticated evidence of an organization's research, operational, or administrative activities, or by the informational value of the data contained within it. Non-record are those records that do not meet all the criteria of a record and as such may be disposed of without archival authority. Non-record materials include extra copies of documents kept only for convenience or reference, stocks of publications and processed documents, and library or exhibit materials. These documents can be disposed of at the discretion of the user.

Permanent/Temporary Classification
Permanent Records are those records determined by the National Archives and Records Administration (NARA) to have historical or enduring value warranting permanent preservation. Any record maintained for 100 years is considered a Permanent Record. Permanent Record status shall be established in accordance with the *General Records Schedule (GRS) and Department of Energy Records Schedule (DOERS.)* Temporary Records are those documents, which are not Permanent Records and are approved by NARA for destruction as indicated in the *GRS*.

Active/Inactive Classification
Records shall be classified as "Active" or "Inactive" by the record owner. Active Records are those documents, records and non-records that are necessary to conduct day-to-day business and referred to at least once a month. Inactive Records are documents that are referred to less than

once a month or are needed only once a year for a specified time period. Both Active and Inactive Records are retained for a duration of time to comply with the stated requirements of the *GRS and DOERS.*

Records Inventory Disposition Schedules

Records Management is controlled by inventorying records on Records Inventory and Disposition Schedules (RIDS). These forms not only inventory records but also indicate their appropriate retention periods. RIDS information shall be input into and tracked on the Laboratory's Documents and Records Database.

Retention

Records shall be retained in accordance to there RIDS. Active and Inactive Records are stored in the office space of the originating organization or are maintained in a low-cost Records Holding Area. The Laboratory's Records Holding Areas consist of the Laboratory's Warehouse and the Iowa State University Library (Archives Section). The retention period for Active and Inactive Records shall meet the minimum retention time as stated in the *GRS and DOERS.* Records with unpublished retention times shall have a request for Records Disposition Authority Form (Standard Form 115) filed with NARA to obtain a proper disposition schedule. These records shall be considered permanent until a disposition schedule is approved by NARA.

Authorization and Receipt Control

Individuals who have custody of records in permanent or temporary storage shall designate those individuals that shall have access to their records and shall be responsible for creating a system for receipt control. The Receipt Control System shall designate the record, recipient, procedure for receipt and inspection of incoming records, and a method for re-cataloguing the record in its original storage facility.

Preservation and Safekeeping

Provisions shall be made to prevent damage from moisture, temperature and pressure. Access controls shall be established to preclude unauthorized personnel from examining confidential records. Record replacement contingency plans shall be enforced for all records designated as Vital Records.

Disposition

Procedural safeguards shall be established to prevent the inadvertent removal or destruction of records. Inactive records shall be transferred from high-cost storage facilities to more economical storage means. Stringent requirements shall be met when determining a records final disposition. Requirements include the records appraisal, record owner's signature and concurrence from either the *GRS or DOERS.*

2.4.4 TRAINING

Detailed programmatic information is provided via the following institutional training modules:

GENERAL EMPLOYEE TRAINING (D &R SEGMENT)	*#AL- 001*
Intended Audience:	*All employees*
Module Format:	*Classroom Instruction, reviews D&R Program and provides associated definitions. Incorporated into presentation on December 15, 1994.*
Associated Retrain Period & Format:	*Retrain is required if employee has been terminated from the Laboratory for more than one-year period.*

RECORD INVENTORY TRAINING	*#AL- 061*
Intended Audience:	*Mandatory for appointed Record Liaisons.*
Module Format:	*Classroom Instruction and exercises. Estimated completion time: 3.5 hours.*
Associated Retrain Period & Format:	*No retrain required.*

There is no associated job activity-specific training required for this training subject.

2.4.5 PERFORMANCE CHECKLIST

Environment, Safety, Health & Assurance (Documents & Records Program) – Shall:

- ❑ Provide assistance utilizing Documentation Procedures for formatting documents that impact at the Laboratory or inter-department level.
- ❑ Review all documents that impact inter-departmentally or at the Laboratory wide level for formatting consistency.
- ❑ Log all reviewed documents in the Laboratory's Document Control Database.
- ❑ Forward all reviewed documents to the Directors' Office for approval and signature.
- ❑ File all **original** hard-copy documents that are approved by management.
- ❑ Provide a **copy** of approved documents to the associated author.
- ❑ Prompt all employees to review their documents in the *Laboratory's Annual Retraining Memorandum.*
- ❑ Update The Records Management Plan and the Records Management and Document Control Policies which have been included in the new Environment, Safety, Health and Assurance Manual.
- ❑ Provide for the on-going Inventory of Records as inactive records that are retired to the Record Holding Area.
- ❑ Schedule Program/Department record series and provide File Plans to these areas.
- ❑ Offer record management assistance to Records Liaisons and to any individuals retiring records to the RHA.
- ❑ Perform the Surveying of potentially contaminated records and shall continue to survey all Laboratory Research Notebooks prior to the microfilming process.
- ❑ Manage the Laboratory's Vital Records Program by performing the microfilming of Research Notebooks, Official Personnel Files, and Occupational records; while also ensuring protection of the Laboratory's vital financial and personnel databases.

- ❑ Provide for the maintenance, storage and protection of Laboratory Records by utilizing a Records Inventory Database and Record Holding Area that meets regulations.
- ❑ Investigate imaging system options and determine which system will retrieve records most efficiently and maintain Laboratory records in accordance with their prescribed retention periods.
- ❑ Evaluate the Laboratory's Records Management Practices by performing an annual self-assessment of the program.

Record Liaisons – Shall:
- ❑ Attend the Records Inventory Training module.
- ❑ Identify all Record Series on the Ames Laboratory Records Inventory Form (form 10200.035) and submit them to the Records Management Program for indexing.
- ❑ Box and label inactive records by their **registered** series name. *Note: Do not mix record series within the same box and do not pack contents tightly.*
- ❑ Maintain custody of the Program/Department's File Plan and shall ensure records are held according to retention schedules.

Document Logkeeper/Custodians (DLCs)
- ❑ Understand the Laboratory's Document Control Program and provide assistance to individuals within their Program/Department.
- ❑ Assign index numbers to documents.
- ❑ Log all associated document information, e.g., index number, document title, document originator, effective date, review date, revision number, controlled status, and usage.
- ❑ Maintain a copy of all Program/Department documentation in a centralized area and/or an electronic copy.
- ❑ Provide assistance utilizing Documentation Procedures for formatting documents that impact at the Laboratory or inter-department level.
- ❑ Direct authors to register all documents that impact at the Laboratory or inter-department with the ESH&A Office.

Information Systems – Shall:
- ❑ Perform tape back-ups of the Laboratory's Mission-Critical Systems.
- ❑ Store tape back-up in a fire resistant case that is stored in a building that is remote from the computer facility.
- ❑ Maintain a Mission-Critical System Contingency and Business Continuity Plan for the Laboratory's systems that contain vital records.

Information Resources Board – Shall:
- ❑ Evaluate and track all Information Resource activities to ensure compliance with Contract performance measures.
- ❑ Support the Documents and Records Management Program in the creation; maintenance and use; and disposition of Laboratory Records.
- ❑ Ensure the compatibility of all Information Resource activities through Strategic Planning
- ❑ Assist in the formulation of overall policy governing the computing environment hardware, application software, and security issues for the Laboratory.

Chief Operations Officer – Shall:

- ❑ Review all incoming Directives from DOE and assign the appropriate Action Manager and Action Coordinators (if applicable).
- ❑ Perform follow-up to ensure Directive suspense dates are met.
- ❑ Serve as a member of the Laboratory's Information Resources Board.

Employees Shall – Shall:

- ❑ Familiarize themselves with basic Records Management terminology, e.g., record, non-record, active and inactive records, series, retention schedules, disposition, etc.
- ❑ Review the Group/Department's established record series and associated retention schedules.
- ❑ *(Research Staff)* Purchase Laboratory Research Notebooks from the Ames Laboratory Storeroom and maintain research highlights in these notebooks.
- ❑ *(Research Staff)* Bring completed Laboratory Research Notebooks to ESH&A, 125 Spedding for microfilming.
- ❑ *(Research Staff)* Submit a copy of R&D Reports or Manuscripts to the Office of Public Affairs and Information, 111 TASF.
- ❑ *(Research Staff)* Maintain records by Project Case Files (when possible) or by subject case files. These will be identified as the researcher's record series.
- ❑ *(Administrative Staff)* Maintain records by subject case file and fiscal year (when possible). These will be identified as the Departments record series.
- ❑ Purge obsolete non-records frequently and ship inactive records to the Record Holding Area.
- ❑ Maintain records in accordance with their established retention periods. *Note: there is a freeze on all epidemiological records. Do not destroy these records.*
- ❑ Review emails prior to deletion to ensure that those that are considered record are printed and maintained with the appropriate Project Case or Subject file.

2.5 WORK PROCESSES

Applicability Statement: *The Work Processes section applies to all employees as each employee is responsible for the quality of their own work and shall embrace the philosophy of Integrated Safety Management for all work activities.*

2.5.1 REFERENCES

Policy 10200.005 Ames Lab Stop Work Authority Policy
Procedure 10200.010, Readiness Review Procedure
Plan 40000.001, Event Reporting Plan

2.5.2 BACKGROUND

Ames Laboratory management has identified the space, activities, and personnel for which Programs/Departments have management responsibilities. Programs/Departments, in turn, have assigned responsibilities to Group/Section Leaders. The Group/Section Leaders closely monitor and manage the day-to-day performance of activities and therefore are best suited to identify and manage the hazards associated with the activities for which they are responsible.

Since each individual is responsible for the quality of her/his own work, he/she needs to have clearly assigned authorities, roles, and responsibilities. Group/Section Leaders utilize work instructions to clearly communicate the requirements and hazards associated with activities.

The Ames Laboratory has developed a set of requirements, supported by procedures and assessed through independent review, to ensure that activities have achieved operational readiness. The level of independence of review and the rigor of application of the requirements for work processes are commensurate with the degree of risks associated with the activities.

2.5.3 PROGRAM INFORMATION

2.5.3.1 Identification of Activities/Hazard Identification/Risk Categorization

Refer to section 1.5.3.1, which provides a complete overview of these topics**:** Identification of Activities, Hazard Identification and Risk Categorization. Procedural information can be found by referencing the Readiness Review Procedure (Procedure 10200.010).

2.5.3.2 Employee Exposures

Ames Laboratory recognizes a strong obligation to provide a safe work place and to monitor and protect the health and safety of its employees. State and federal regulations require that physical examinations and medical monitoring be provided to employees having potential exposures to work place hazards that have identified health risks.

It is the responsibility of Group/Section Leaders to be aware of employee exposures and hazards and to complete a Hazard Inventory Form for all Ames Laboratory employees prior to the beginning of their work assignment. This information will reside in the employee's medical record. When an employee's exposure to hazards changes, due to a change in activities or job

responsibilities, the Group/Section Leader shall update the affected employee's Hazard Inventory Form. Help and assistance are available from Occupational Medicine (294-2056) or the Environment, Safety, Health & Assurance Office (294-2153).

2.5.3.3 Work Instructions

Clear and concise work instructions shall be used to clearly communicate the requirements and hazards associated with activities in a timely manner. The level of formality of work instructions shall be commensurate with the complexity and risks associated with the activity. Written instructions are required for activities with moderate/high complexity and/or risk. Written instruction may take the form of notes, memorandums, entries in logbooks and record books, forms, procedures, plans, and manuals. Such written instructions shall clearly communicate all information necessary to perform the work in an efficient and safe manner. Formal written procedures shall be prepared and used to direct the work associated with activities that impact multiple organizations, have significant ES&H or programmatic impact or have Lab wide impact. The procedure for Writing Formal Procedures (Procedure 10200.001) shall be utilized to direct the preparation of these formal procedures. Operator Aids (information posted for operator use) may be used to supplement oral or written instructions. Operator Aids may come in many forms: copies of documents, system drawings, handwritten notes, information tags, and graphs. Operator Aids shall be signed, dated, and reviewed annually for appropriateness.

2.5.3.4 Job (Activity) Specific Training and Reading Requirements

Management shall provide Job (Activity) Specific Training and utilize required reading to complement the education, experience, and knowledge of individual workers. Supervisors shall be responsible for the administration and documentation of training associated with the activities for which they have management responsibilities. Required reading shall be utilized to ensure that appropriate individuals are made aware of important information that is related to job assignments. Specific guidelines for Job (Activity) Specific training are addressed in the Training Section (3.3.4).

2.5.3.4 Communication

Audible communication should be clear and concise. The receiver to the extent necessary for the sender to ensure the instructions are correctly understood should repeat audible communication involving information useful in a potentially dangerous situation. Audible communications equipment used to transmit emergency information or make required notifications shall be maintained to assure its operability during emergencies.

2.5.3.5 Logkeeping

Employees involved with shift-oriented work, as in hourly workers with consecutive shifts, shall utilize entries in logbooks to notify the next worker of status and operating conditions of the involved activity so that appropriate actions can be taken to maintain the safety and quality of work performance. Group/Section Leaders shall establish applicability of logkeeping for their specific activities. Guidelines for logkeeping shall include prompt recording, conditions and parameters of the activity, legibility of entries (black waterproof ink is recommended), method for corrections (single line through the incorrect entry, with initialed and dated corrections), periodic review by supervisor, and storage of logs.

2.5.3.6 System Components, Status, and Access

Maintenance and status of system components, including structures, facilities and equipment, shall be controlled to the extent that activities can be performed safely and effectively. Independent Walk Throughs shall review all laboratory equipment in accordance with the Property Management Regulation 109-25.109-1 (Idle Equipment). Also, access to system components shall be controlled through administrative procedures, signage and physical barriers, according to the item's associated risk. Group/Section Leaders shall determine the level of review and independence of verifications necessary to ensure the reliability of system components. Program Directors/Department Managers and Group/Section Leaders and employees shall conduct observations and Program/Department Walk-Throughs, as outlined in the Assessment Section (10) to ensure that ES&H considerations and activity functions are being conducted appropriately.

2.5.3.7 Signage and Labeling

Signage, the usage of signs for the notification of dangers, routes of egress, and access control, etc., are to be consistent with the signs approved by the ESH&A Office. Labeling, the marking of equipment and piping shall be consistent with the labels used and approved by the Facilities Services, Engineering Services and ESH&A Offices. Labeling shall be utilized for the identification and control of items as necessary.

2.5.3.8 Stop Work Authority

The purpose of the Stop Work Authority Policy is to provide Ames Laboratory employees with a Stop Work Authority process to prevent serious injury, impairment of health, or adverse impact to the environment. Included in this policy is a process to start up operations that have been shut down (Readiness Review Procedure #10200.010). The concept of having Stop Work Authorization for Ames Laboratory employees is recognized as a good management practice. Additional information regarding Stop Work Authority can be found in the Industrial/General Safety Program Section (5.2).

2.5.3.9 Investigation and Notification of Abnormal Events

Effective response to environmental, safety and health events requires timely notification of the appropriate organizations. Ames Laboratory has numerous reporting responsibilities related to environmental, safety and health events. These requirements include: Occurrence Reporting as per DOE Order 232.1, Occurrence Reporting and Processing of Operations Information; reporting of radiological incidents (Price-Anderson Act Amendments reporting); reporting of injuries and illnesses to the Computerized Accident/Incident Reporting System (CAIRS) as required by DOE Order 231.1, Environment, Safety and Health Reporting; and reporting of incidents of security concern as per DOE Order 471.3, Incidents of Security Concern. Further detail regarding the Reporting of Events can be found in the Introduction Section (1.6).

2.5.4 TRAINING

GENERAL EMPLOYEE TRAINING (GET) FOR NEW EMPLOYEES #AL-001	
Intended Audience:	*Mandatory for all employees*
Module Format:	*The various work processes topics are incorporated in the "General Safety" section of General Employee Training (GET Estimated completion time: 2.0 hours.*
Associated Retrain Period & Format:	*No retrain required.*

2.5.5 PERFORMANCE CHECKLIST

Director - Shall:

- ❑ Have Stop Work Authority for all Ames Laboratory activities and all activities performed in Ames Laboratory or rented space.

Program Directors/Department Managers - Shall:

- ❑ Promote Readiness Review with Group/Section Leaders
- ❑ Stop Work in all the areas for which they have been assigned responsibility.
- ❑ Ensure employees and contractors performing work at the facility adhere to the Stop Work Program.
- ❑ Adhere to Document Control Program requirements for all documents with inter-departmental or lab-wide impact.
- ❑ Check for idle and obsolete equipment during Program/Department Walk-through.
- ❑ Repeat communications when it is in regard to a potentially dangerous situation to ensure it is correctly understood.

Group Section Leaders & Supervisors - Shall

- ❑ Identify activities and associated hazards and submit activities for Readiness Review.
- ❑ Comply with the recommendation of Readiness Review
- ❑ Ensure that all incidents, accidents, injuries and abnormal events are reported in a timely fashion.
- ❑ Cooperate with all investigative and corrective efforts related to incidents, accidents, injuries and abnormal events
- ❑ Stop Work in all the areas for which they have been assigned responsibility.
- ❑ Ensure employees and contractors performing work at the facility adhere to the Stop Work Program.
- ❑ Adhere to Document Control Program requirements for all documents with inter-departmental or lab-wide impact.
- ❑ Identify and administer Job (Activity) Specific Training and maintain the associated training records.
- ❑ Check for idle and obsolete equipment on an on-going basis.
- ❑ Repeat communications when it is in regard to a potentially dangerous situation to ensure it is correctly understood.

Environment, Safety, Health & Assurance - Shall:
- Administer the Readiness Review processes and maintain appropriate documentation and database information.
- Administer the Laboratory's efforts for reporting and investigation of incidents, accidents, injuries, and abnormal events, and maintain related processes and appropriate documentation
- Have Stop Work Authority for all Ames Laboratory activities and all activities performed in Ames Laboratory or rented space.
- Adhere to Document Control Program requirements for all documents with inter-departmental or lab-wide impact.
- Review, approve and display signage and labeling for notifications of danger, routes of egress, and access control.
- Repeat communications when it is in regard to a potentially dangerous situation to ensure it is correctly understood.
- Maintain emergency communication equipment.

Facilities and Engineering Service Offices - Shall:
- Review, approve and display signage and labeling for the marking of piping and equipment.
- Repeat communications when it is in regard to a potentially dangerous situation to ensure it is correctly understood.
- Maintain emergency communication equipment.

Procurement - Shall:
- Check for idle and obsolete equipment during the Independent Walk-through Program.

Employees - Shall:
- Report all incidents, accidents, injuries and abnormal events in a timely fashion.
- Cooperate with all investigative and corrective efforts related to incidents, accidents, injuries and abnormal events.
- Repeat communications when it is in regard to a potentially dangerous situation to ensure it is correctly understood.
- Record the status and operating conditions of activities that are affected by shift work to assure appropriate actions can be taken to maintain the safety and quality of work performance.

2.6 DESIGN

Applicability Statement: *The Design Process resides with the Engineering Services Department and the Facilities Services Group, 158 Metals Development. Employees needing Engineering Services or Facilities Services work assistance should call 4-3496 or 4-3756 respectively.*

2.6.1 REFERENCES

Form 46200.036 Service Order Requisition
Procedure 10200.010 Readiness Review Procedure
Procedure 10200.037 Activity Status Review Procedure

2.6.2 BACKGROUND

The design activities of the Ames Laboratory are primarily the responsibility of the Engineering Services and Facilities Services Groups. The Service Order Requisition (SOR) (Form 46200.036) is utilized to control and document the planning and development of design and fabrication activities with the service departments. The requested field information on the SOR form documents that anticipated safety impacts are considered during the design process by having both the requestor and service provider(s) address potential safety hazards at the inception of the activity. The requested information documents the Readiness Review (RR) or Activity Status Review (ASR) number (if any) assigned to the project and identifies potential safety impacts to both the requester and the service provider for the service being performed. The ESH&A office receives a copy of the final, processed SOR. The Program Information Section 2.1.3, below, defines the design process within the specific Groups and delineates the Design Policy/Requirements for quality assurance as driven by Integrated Safety Management policies.

2.6.3 PROGRAM INFORMATION

2.6.3.1 Facilities Services - Facilities Design

Design activities are carried out primarily by Facilities Services' engineers with the support of Autocad and a draftsperson. Drawings and specifications are reviewed and approved by the appropriate project engineer and/or the Manager of Facilities Services.

Project design, which cannot be completed due to time constraints or special requirements, are referred to an outside architectural firm, which has a standing contract with the Ames Laboratory. The project engineer and the Manager of Facilities Services also review these contract documents. As-built drawings are used to keep the Autocad-generated floor plans up-to-date.

Project design is performed based on a Service Order Requisition (SOR). The standard procedure for handling SOR's includes review by ESH&A. The level of review is commensurate with the scope of the project and for complex projects with significant hazards; a formal Readiness Review may be required. Facilities Services SOR closeout procedures include

feedback from the requestor verifying that the design/execution of the project meets the requestor needs.

Under design control, the project engineer/designer assumes additional responsibilities. These include: generation of preliminary plans, specifications, initial cost estimates, and project description; assuring performance to specification of the final product; cost control on the work order/job order; timely procurement of all materials or parts; completion of the design; project scheduling, project status tracking, setup and delivery of the final product; and documentation/ generation of final as-built specification drawings.

2.6.3.2 Engineering Services - Experimental Equipment Design

Major projects requiring design are identified as a Work Order (WO) or Job Order (JO) via completion and approval by the requester of the 'Service Order Request' (SOR) form. In accordance with Laboratory policy, all design performed on projects is defined, controlled, and verified.

For each project requiring 40 or more hours of design effort, a project file folder to contain all documentation is created by the ESG-Admin. office and checked out to the assigned Project Engineer/Designer. The Project Engineer/Designer is the cognizant staff member most knowledgeable about the particular project. All design and fabrication project correspondence including copies of purchase orders for procured parts are contained or referenced in the project file. In all cases, the design adequacy is verified by the Project Engineer/Designer. Major design changes from the original scope of work are to be documented via notes in the project file folder for future incorporation as needed into the as-built specifications and drawings.

Under design control, the Project Engineer/Designer assumes other responsibilities as appropriate.

- Generation of preliminary plans, specifications, initial cost estimates, and project description.
- Compliance with appropriate standards and codes and ESG/Ames Laboratory safety and quality procedures per ISM policies as described in the next paragraph addressing design work.
- Completion of the design (usually by Computer Aided Engineering and Computer Aided Design (CAE/CAD).
- Timely procurement of all materials or parts.
- Fabrication scheduling.
- Cost control of authorized project funding.
- Project status tracking, system testing, setup and delivery of the final product.
- Assuring performance to specification of the final product.

- Final documentation/generation of final as-built specification drawings.

- Completion of the 'Quality Assurance Document Record', organization, and return of project file folders to the ESG-Admin. Office for archiving upon project completion.

Design work, including changes, shall be reviewed to ensure compliance with applicable ES&H requirements. Reviews shall address design inputs, such as fire protection requirements, design bases, and reliability requirements. Final designs, field changes, and modifications should be approved by the original design organization or a technically competent designee and shall be translated into specifications and drawings. Items associated with ES&H Hazard Levels II or III shall be subject to review by ESH&A with input from the following groups: Engineering Services, Facilities Services, and Information Systems. Items associated with ES&H Hazard Levels II or III activities shall also be subject to review by the Safety Review Committee. All design items will be verified before final installation and functionality. The Readiness Review Approval Form shall be used as the primary control instrument to ensure appropriate design reviews for new or significantly modified experimental equipment.

Implementation of CAE/CAD in Engineering Services has necessitated making changes in previous design procedures as a quality control measure, these changes are:

Mechanical Work Groups

To assure the proper routing of a project through design, fabrication, testing, and delivery, a Quality Assurance Document Record' will be attached to each project folder. This record will track all design and material procurements as the project proceeds to completion. Design notes on any significant design and/or fabrication field changes, provides additional documentation in the project file folder.

All projects requiring welding, shall be reviewed to determine if the nature of the work requires that the welding must be performed as part of the *Certified Welding Program*. If such, all activity will be performed using the procedures defined in *Procedure No. 46200.001 Welding Program.*

Electronics Work Groups

Projects in electronics utilize separate quality assurance project documentation forms to insure the proper sequence in design and fabrication is followed. A 'Quality Assurance Document Record' documents all design as well as any material procurements as the project proceeds to completion. An Electronics CAD (ECAD) on-line monitoring system rigidly enforces methodology by automatically tracking a project through the electronic design CAD system in proper design sequence including schematic capture, board placement, auto route, photo tape, Gerber tape and archive state. Design notes for any significant changes in the design or fabrication schedule are filed in the project folder.

The generation of final project documents and as-built drawings is the responsibility of the Project Engineer/Designer assisted by Shop Supervisors of the Development Machine Shop and Technical Shop, with inputs from the respective machinists and electronic technicians.

2.6.3.3 Information Systems

Users specify program requirements and the Information System staff designs programs according to current standards and practices. Programs are then reviewed by the User and are modified as necessary. Once all modifications are complete the User signs-off on the jobs proper completion. The Information System staff prepares final User and Technical documentation. These documents are maintained by Information System to allow for future modifications and troubleshooting. In addition, Program files are backed up daily at 2:00 a.m. and are stored in a remote location to prevent loss.

2.6.3.4 Environment, Safety, Health and Assurance

The ESH&A Manager and safety specialists review SORs that have a potential safety impact for the requestor and/or the service provider. This review process helps to ensure that all safety aspects are addressed prior to operation.

2.6.4 TRAINING

All design engineers and specialists are qualified by their educational degrees and/or experience and receive on-going professional development training as necessary. Undergraduate student engineers will be excluded from performing engineered safety system design and will be closely supervised during the performance of all design efforts. Special training will be given to undergraduate student engineers regarding limitation of design efforts and supervision requirements. Their work will be reviewed and checked by their Work Group Supervisor.

2.6.5 PERFORMANCE CHECKLISTS

Facilities / Engineering Services shall:

- Review all SORs to assess any potential safety impact for the requestor or the service provider.
- Ensure design projects are defined, controlled, and verified.
- Ensure sound engineering/scientific principles and appropriate technical standards and codes are incorporated into the design of structures, systems, processes, and components to a level of detail commensurate to the risk associated with the activity involved.
- Identify design interfaces and coordinate all participating organizations.
- Verify the adequacy of designs by qualified individuals or a group other than those who performed the original work prior to procurement, manufacture, or construction.
- Maintain design project files and apply all quality assurance procedures.

- **Information Systems** shall:
- Develop and enhance programs to support the Laboratory's continuous improvement efforts.
- Maintain system documentation and associated software in accordance with records management practices.
- Ensure mission-critical systems are protected by creating daily back-ups.

Environment, Safety, Health & Assurance shall:

- Review all SORs to assess any potential safety impact for the requestor or the service provider.
- Initiate a Readiness Review if a project warrants.

2.7 PURCHASING AND PROPERTY SERVICES

A*pplicability Statement:*

The Procurement, Property Management, and Travel functions resides with the Purchasing Office, 211 TASF. ***Purchasing information can be obtained from the Ames Laboratory Procurement Policies and Procedures Manual (58300.001), the Purchasing Guide (58302.001), the Property Management Guide (58301.001), and the Travel Handbook (58700.001). Employees needing purchasing assistance should call 4-1780.***

2.8 INSPECTION & ACCEPTANCE TESTING

Applicability Statement:

The Inspection and Acceptance Testing section primarily applies to Facilities; Engineering Services; Environment, Safety, Health and Assurance; and the Purchasing Department with implementation assistance from Program/Department Managers and Group/Section Leaders.

2.8.1 REFERENCES

Plan 10200.001, Calibration Plan *(In Development)*
Procedure 46200.001,Welding Program Procedure (Engineering Services)
Procedure 46300.001, Welding Program Procedure (Facilities Services)
Plan 46200.002, Hoisting and Rigging Program
Policy 46200.013, Hoisting and Rigging

2.8.2 BACKGROUND

Inspection and Acceptance Testing of specified items is conducted at the Ames Laboratory utilizing established procedures. The inspection process involves the real-time quality control examination and/or observation of activities or items in relation to approved acceptance criteria as demonstrated by procedures, specifications, checklists or drawings. The main Inspection and Acceptance Testing Areas are Procured Items, Measuring and Test Equipment, Welding, Hoisting and Rigging Equipment, and Safety Equipment.

2.8.3 PROGRAM INFORMATION

2.8.3.1 Procured Items

A purchase requisition must be completed for every order that is processed through the Ames Laboratory Purchasing Office. The Purchasing Office's Buyer will place the order and will work along with the requestor to ensure that the vendor is offering items that conform to the specifications required. Purchase orders are coded to trigger a review by an Engineering Services Technical Specialist if it meets certain criteria. The specialist will assign a QA Rating of High, Moderate, or Low. Items with a QA Rating of "Low" will receive a general inspection by the warehouse and the requestor. Items with a QA Rating of "Moderate" will receive an inspection by the warehouse, the requestor, and a specialist. Items with a QA Rating of "High" will receive a formal inspection by the Laboratory's Engineering Services Group (ESG). Once the item is received at the Ames Laboratory warehouse it is visually inspected for damage, matched against the purchase order and packing slip. The item is then routed to the requestor's specified delivery address by local transportation means. The requestor then inspects the goods for conformance with his/her specified requirements.

2.8.3.2 Measuring and Test Equipment Calibrations

The Ames Laboratory Calibration Committee (ALCC) developed an Ames Laboratory Calibration Plan (Plan 10200.001) to guide the implementation of the Laboratory's Calibration Program. The Ames Laboratory Group/Section Leaders are charged with the responsibility of

assuring that Measuring and Test Equipment is of proper type, accuracy, and tolerance to accomplish the specified requirements. In addition, they shall ensure that all instruments or equipment are properly labeled with a Calibration Inventory Label, e.g., "In Calibration System" Label (red) or an "Not In Calibration System" Label (green).

Items shall be calibrated and adjusted at specified periods to maintain accuracy within necessary limits and shall have known valid traceable relationships to nationally recognized standards or the documented procedure of an Ames Laboratory expert. Calibration standards shall be traceable to four levels: 1) calibrated and traceable to a NIST Standard; 2) calibrated and traceable to a Laboratory Standard; 3) calibrated and traceable to a comparable piece of equipment or instrumentation which is traceable to a NIST or Laboratory Standard; and, 4) calibrated to a known sample. The frequency of calibration shall be directly dependent upon the equipment's required accuracy, intended use, frequency of use, stability characteristics and how it influences the quality of an item's characteristics.

The Calibration database (*In development*) shall identify all equipment that is subject to specified calibration cycles. Equipment location, contact person, vendor source and calibration frequency are just a few of the items identified. The system shall also generate reminder notices (Calibration Transmittal Notices) to the contact person identified with the equipment item or instrument. Once an item is calibrated the Engineering Services Group shall adhere a "Calibration Verification Label" to the calibrated item. The Calibration verification Label will indicate the calibration technician, item number, calibration level, date inspected, and its future reinspection date.

2.8.3.3 Welding

All welding (includes brazing and silver soldering but does not include soft soldering and does not include spot welding for research purposes, e.g., thermocouples and electronic contacts) at the Ames Laboratory shall be performed by the Engineering and Facilities Services Groups. The welding program for the Engineering Services Group is governed by the Welding Program Procedure (Procedure 46200.001). The welding program for the Facilities Services Group is governed by the Welding Program Procedure (Procedure 46300.001). Refer to the Industrial/General Safety Program Section (5.10) for more detailed information regarding the Laboratory's Welding Program.

2.8.3.4 Hoisting and Rigging

Hoists and cranes shall undergo inspection and load tests when installed and after major modifications or replacement of major load carrying parts. In addition, hoists and cranes shall be inspected on an annual basis and load tests shall be performed at a frequency commensurate with the hazard of the operation. A Hoist and Crane Inspection Tagging shall be placed visibly on the equipment. The inspection label indicates the re-inspection date. The hoist or crane shall not be operated without a current inspection tag in place.

All hoist and crane operators shall be trained by a written examination; hands-on practice lifts, and must have a current Ames Laboratory physical exam on record with Ames Laboratory's Occupational Medicine Office. The operator is issued an operator ID Card after completing the above stated requirements. Once the operator is issued the ID Card, the verification of Hoist and

Crane Training shall be maintained on the Ames Laboratory Training Records System (ALTRS), which also identifies the operator's three year re-train date.

The Environment, Safety, Health and Assurance Department shall maintain a Master Listing of all hoist and crane equipment. Detailed information regarding the Hoisting and Rigging Program can be found in the Industrial/General Safety Program Section (5.16).

2.8.3.5 Safety Equipment

Ames Laboratory personnel conduct inspections of various types of equipment related to safety. These inspections are based on criteria, such as, the performance of the equipment and the performance of maintenance. The items are labeled to indicate physical inspection, test and/or the performance of maintenance procedures.

2.8.4 TRAINING

Detailed programmatic information is provided via the following institutional training modules:

HOISTING AND RIGGING	*#AL- 014*
Intended Audience:	*Mandatory for all workers whose job assignments involve use, servicing or maintenance and inspection of hoists..*
Module Format:	*Classroom Instruction, handouts, hands-on use (practice lift), and quiz. Estimated completion time: 1.5 hours.*
Associated Retrain Period & Format:	*3 year retrain; Classroom Instruction, hands-on lift, and quiz.*

WELDING SAFETY and HOT WORK	#AL-149
Intended Audience:	*Mandatory for Ames Lab individuals who perform electric or gas welding and cutting.*
Module Format:	*Classroom Instruction with video. Estimated completion time: 1 Hour*
Associated Retrain Period & Format:	*Three-year retrain. Retrain module consists of Classroom and video.*

Group activity-specific training shall be given to each employee prior to work that includes a hands-on lift and safety, maintenance and procedural information. This training shall be documented by the Group Leader/Department Manager and the records maintained for a period of 5 years.

2.8.5 PERFORMANCE CHECKLIST

Facilities – Shall:

- Maintain a database which tracks standard and/or preventative maintenance inspections that must occur at prescribed intervals.
- Conduct walk-through inspections and log inspection information in the work system in the form of repair tickets, corrective work tickets or add it to the inventory of maintenance work.

- Ensure Welding designs and specifications are written by a registered Professional Engineer licensed in the state of Iowa.
- Ensure Welder qualifications and welding performance are accomplished in accordance with American Welding Society and American Society of Mechanical Engineers codes for welder qualification and structural welding.
- Conduct weld inspections by a welding inspector certified by the American Welding Society.
- Perform weld inspections in accordance with American Welding Society and American Society of Mechanical Engineers codes.
- Release welding jobs only after receiving a Weld Inspector's final approval and will maintain Weld reports as a permanent part of the "Job Record".
- Inspect Emergency showers monthly and will initial and date the Emergency Shower/Eye Wash Test Record Tag when completed. Nonconforming showers shall be fixed on the spot or tagged out of service until corrected.
- Utilize a computer driven ticketing system to prompt the conduction of inspections related to safety. Facilities Services personnel shall conduct inspections: monthly of alarm and water flow rates; quarterly of fire doors; yearly of fire sprinkler systems, fire hoses, and fire dampers; and twice per year of the Pyrotronics fire sensor system.
- Replace, fix, or tag-out any nonconforming fire protection system.
- Work in a collaborative manner with ESH&A to inspect and maintain fume hoods on an annual basis. Nonconforming fume hoods shall have a corrective maintenance ticket issued by the Facilities Group and fume hood adjustment shall be performed according to their work load schedule.

Engineering Services – Shall:

- Inspect activities that are categorized as new or significantly altered or modified.
- Conduct system performance tests and verify an item or apparatus' performance in accordance with associated requirements (e.g., high temperature components, high voltage insulation where required, or selected materials with low expansion coefficients).
- Ensure that equipment designed and fabricated for scientific users meets the scope of work as defined by the Job Order or Work Order.
- Document inspection/test results in project or equipment files.
- Review certain purchases by cost code and shall assign a Quality Assurance Rating of High, Moderate, or Low.
- Perform Calibrations on identified Measuring and Test Equipment.
- Segregate M&TE, which is found to be out of Calibration and will identify it by affixing an "Out of Calibration Tag".
- Ensure Welding designs and specifications are written by a registered Professional Engineer licensed in the state of Iowa.
- Ensure Welder qualifications and welding performance are accomplished in accordance with American Welding Society and American Society of Mechanical Engineers codes for welder qualification and structural welding.
- Conduct weld inspections by a welding inspector certified by the American Welding Society.
- Perform weld inspections in accordance with American Welding Society and American Society of Mechanical Engineers codes.
- Release welding jobs only after receiving a Weld Inspector's final approval and will maintain Weld reports as a permanent part of the "Job Record".
- Perform a monthly check of all Field Interface Units (FIU's) and their associated Uninterruptible Power Supplies (UPS's) for the Johnson Control JC-85.

- Program and maintain the JC-85 Plant Protection System head-end equipment and shall coordinate with Johnson Control when contract service work is required.
- Conduct monthly checks and annual inspections of the Public Address communication system.

Environment, Safety, Health & Assurance – Shall:
- Maintains a list of items or activities that need regular inspection and are also on call to inspect other items or processes that require their expertise.
- Maintains a Calibration Database that contains all instruments and equipment which require some level of calibration, the manufacture's name, instrument type, serial number, contact person, cycle time, equipment location, and future calibration date.
- Provide Hoisting and Rigging Training and will coordinate the medical physicals through Occupational Medicine.
- Oversee the Laboratory's Hoisting and Rigging Program and maintain a master list of all Laboratory hoists and cranes.
- Coordinate the annual review of Laboratory hoists and cranes
- Inspect Eye Wash Stations monthly and will initial and date the Emergency Shower/Eye Wash Test Record Tag when completed. Nonconforming Eye Wash Stations shall be fixed on the spot or tagged out of service until corrected.
- Conduct weekly inspections of first aid kits and quarterly inventories of the first aid closets. Nonconforming kits will be noted and corrected.
- Maintain the blind bar code system and the Maintenance Inspection Record Tag to document the inspection of fire extinguishers.
- Conducts several daily checks of the Laboratory's communication systems.
- Work in a collaborative manner with Facilities to inspect and maintain fume hoods on an annual basis.

Purchasing – Shall:
- Validate that suppliers are providing acceptable items and services by continually reviewing feedback from issued Quality Assurance Notices.
- Eliminate vendors from the competitive bid process if their items are nonconforming.
- Verify that items purchased conform to the specifications of the requestor and requirements of the Department of Energy.
- Visually inspect received orders for damage and will match the purchase order against the packing slip.
- Produce Discrepancy Reports for nonconforming goods and shall segregate the item until receiving personnel have solved the problem.
- Ensure credit or replacement items for nonconforming orders.
- Coordinate Quality Assurance Reviews of goods with the Engineering Services Department.

Program Directors/Department Managers & Group Leaders/Section Leaders - Shall
- Incorporate administrative controls into the inspection process (procedure) to preclude inadvertent bypassing of required inspections.
- Assure that Measuring and Test Equipment is of proper type, accuracy, and tolerance to accomplish the specified requirements.
- Label instruments or equipment with a Calibration Inventory Label, e.g., "In Calibration System" Label (red) or an "Not In Calibration System" Label (green).

- Ensure Measuring and Test Equipment is calibrated against standards having an accuracy that will ensure that equipment maintains the required tolerances.
- Affix a Calibration Verification Label on M&TE if they perform the calibration.
- Maintain Calibration Verification reports in their files.
- Ensure that hoist and crane operators have completed the Laboratory's Institutional Training module (AL-014) prior to this activity. In addition, they will ensure that they will complete the three-year retrain requirement to maintain qualified.
- Maintain a complete and current record of inspection(s); documentation of each Engineered Lift; and an inventory of hoists and cranes which includes manufacture, model number, serial number, type, and capacity.

All Employees – Shall
- Inspects purchases for conformance with his/her specified requirements.
- Attend Hoisting and Rigging Training (AL_014) if they will be utilizing this equipment.

2.9 ASSESSMENTS

Applicability Statement:

Assessments apply to all employees. ESH&A also provides for the tracking and resolution of employee concerns and trending of dificiencies. ***The Laboratory's Assessment Program is discussed in its entirety in Section 10.***